

REMARKS

Claims 1, 2 and 4-13 are pending.

Claim 1 has been amended to recite that the particulate elastomer is selected from polybutadiene “modified with carboxyl group,” polyisoprene “modified with carboxyl group” or styrene/butadiene copolymer modified with carboxyl group. In addition, claim 1 has been amended to recite that the powdery mixture 2 to 10 parts by weight of the particulate elastomer “per 100 parts by weight of the combination of the particulate elastomer and the carbonaceous material.” These amendments have been made to clarify claim 1.

Claim 4 has been amended to recite that the carbonaceous material further comprises an additive that increases electroconductivity. This amendment has been made in accordance with the Examiner’s suggestion.

Claim 10 has been amended to recite that the powdery mixture comprises “80 to 96 parts” by weight of the carbonaceous material per 100 parts by weight of the combination of the particulate elastomer and the carbonaceous material. Support for this amendment can be found on page 10 of the specification.

Claim 13 has been amended for clarity.

No new matter has been added by way of the above-amendment.

Drawings

The Examiner maintains the objection to the drawings and alleges that the drawings must show every feature of the invention specified in the claims. In response, Applicants have attached Figure 1 which includes features of claim 1.

As such, reconsideration and withdrawal of the objection are respectfully requested.

Claim Objections

The Examiner objects to claim 4. Specifically, the Examiner objects to the phrase “an electroconductivity additive”. In response, Applicants have followed the Examiner’s suggestion of replacing this phrase with the phrase “an additive that increases electroconductivity”.

As such, reconsideration and withdrawal of the objection are respectfully requested.

Issues Under 35 U.S.C. § 112, Second Paragraph

Claims 1-2 and 4-13 are rejected under 35 U.S.C. § 112, second paragraph, for being indefinite. Applicants respectfully traverse the rejection.

The Examiner objects to claim 1 alleging that it is not clear which polymer is modified with the carboxyl group. In response, Applicants have amended claim 1 to clarify this feature of the invention.

The Examiner notes that claim 1 recites that 2-10 parts by weight of the particulate elastomer is present in *100 parts by weight of the powdery mixture*. The Examiner has taken the position that it is unclear what constitutes the “100 parts by weight of the powdery mixture.” The Examiner questions whether the 100 parts by weight of the powdery mixture is: a) just the particulate elastomer and the carbonaceous material; or b) the particulate elastomer and the carbonaceous material and optionally any other components. In response, Applicants have amended claim 1 to clarify that the 100 parts of the powdery mixture is made of a) just the particulate elastomer and the carbonaceous material.

With respect to claim 10, the Examiner objects to claim 10 for not further limiting claim 1. In response, Applicants have amended claim 10 for clarification.

The Examiner objects to claim 13 for not clearly defining the step of mixing. In response, Applicants have amended claim 13 for clarification.

In view of the fact that the claims as amended, particularly point out and distinctly claim the subject matter which Applicants regard as the invention, the claims meet the requirements of 35 USC 112, second paragraph. Reconsideration and withdrawal of the rejection are respectfully requested.

Issues Under 35 U.S.C. § 103

The following prior art based rejections are pending:

- (A) Claims 1-2, 4, 7 and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao et al. (US 6,246,568 B1, hereinafter “Nakao”) in view of Noguchi et al. (US 6,800,222 B1, hereinafter “Noguchi”);
- (B) Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao and Noguchi, as applied to claim 4, above, and further in view of Sonobe et al. (US 6,258,337 B1, hereinafter “Sonobe”); and
- (C) Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao and Noguchi, as applied to claim 1, above, and further in view of Moriguchi et al. (US 2001/0051300 A1, hereinafter “Moriguchi”).

Applicants respectfully traverse the rejections.

M.P.E.P. § 2143 sets forth the guidelines in determining obviousness. First, the Examiner has to take into account the factual inquiries set forth in *Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), which has provided the controlling framework for an obviousness analysis. The four *Graham* factors of: determining the scope and content of the prior art; ascertaining the differences between the prior art and the claims that are at issue; resolving the level of ordinary skill in the pertinent art; and evaluating any evidence of secondary considerations (e.g., commercial success; unexpected results). 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). Second, the Examiner has to provide some rationale for determining obviousness, wherein M.P.E.P. § 2143 set forth some rationales that were set established in the recent decision of *KSR International Co. v Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). Here, the Examiner has not appropriately resolved the *Graham* factors, including ascertaining the differences between the prior art and the claims that are at issue. Also, Applicants enclose herewith an Experimental Report (Applicants plan to submit this Report in Declaration form shortly) as a secondary consideration.

Inventive claim 1 requires that the method for producing the electrode includes the step of mixing a powdery particulate elastomer with a powdery carbonaceous material to form a powdery mixture. Also, present claim 1 recites a step of “dry forming.” The Examiner relies

largely on the teachings of Nakao for these features in inventive claim 1, (see column 4, lines 13-15 of Nakao, wherein the dried conductive electrode is wound on a separator). However, Applicants respectfully submit that the Examiner's position is improper.

In the present invention, dry-forming is distinct from "wet-molding" such as coating or spraying. Examples of such dry-forming methods include press-molding, powder molding, rolling, and extrusion molding (See paragraph [0044] of the present application).

In contrast, Nakao discloses a method comprising the steps of applying (wet coating) the electrode solution on both sides of the conductive film, and then drying the coated film. As such, the method disclosed in Nakao is a "wet-molding" not a dry-forming, as presently claimed.

In addition, the secondary references to Noguchi, Sonobe and Moriguchi do not cure the deficiencies of Nakao. As such, there are differences between the prior art and the claims that are at issue, which the Examiner has not accounted for in making the rejection(s).

Furthermore, the presently claimed invention has unexpectedly superior properties over the teachings of Nakao as evidenced by the attached Experimental Report.

The attached Experimental Report shows that when the mixture is diluted with water to a concentration of solids of less than 50 wt% such as taught by Nakao, in a method for producing an electrode for an electric double layer capacitor comprising a step of dry-forming, the performance of the produced electrode and electric double layer capacitor is low. As is obvious from the Experimental report, the inventive method which includes a step of dry-forming gives an electric double layer capacitor having excellent electrode layer strength, high capacity and small internal resistance. Especially, there is improved capacity and internal resistance when compared with the case where the wet mixture like Nakao is used to form electrode layer.

Thus, according to the present invention, since the mixture with a high solids concentration is dry formed without dilution to form the electrode layer of the electric double layer capacitor, there is obtained an electrode layer having excellent electrode layer strength, high capacity and small internal resistance.

It is respectfully submitted that neither the claimed steps nor the advantageous properties derived therefrom are taught or fairly suggested by Nakao, either taken alone or in combination

with the secondary references to Noguchi, Sonobe and Moriguchi. As such, even if a *prima facie* case of obviousness were to exist, the evidence of unexpected results overcomes the *prima facie* case. Reconsideration and withdrawal of the rejections are respectfully requested.

Claims 5 and 6

Applicants respectfully submit that claims 5-6 are further distinguished from the teachings of the cited art. With respect to claims 5-6, the Examiner uses Sonobe in the rejection of inventive claims 5-6. As mentioned above, Sonobe does not cure the deficiencies of Nakao, since Sonobe does not teach or fairly suggest a step of dry forming or the unexpected advantages derived therefrom.

With respect to claim 5, Sonobe discloses that a composite electrode material may be formulated by mixing the carbonaceous material with a binder, which is compression-molded to form a polarizable electrode (column 5, lines 8-18). Sonobe does not disclose that the binder is a particulate elastomer as is required by the present claims.

With regard to claim 6, the Examiner has taken the position that Sonobe discloses that the powdery mixture is a mixture obtained by fluidized bed granulation or fluidized bed multifunction mode granulation (column 7, line 22-30). Applicants respectfully disagree. Sonobe discloses that a carbonaceous material (thermally infusible porous pitch product) was subjected to a steam activation treatment in a fluidized bed. Notably, Sonobe does not disclose granulation in a fluidized bed.

As such, significant patentable distinctions exist between the present invention and the teachings of the cited art.

Claims 8-9

Applicants respectfully submit that claims 8-9 are further distinguished from the teachings of the cited art. With respect to claims 8 and 9, the Examiner relies on Moriguchi in the rejection of inventive claims 8-9. As mentioned above, Moriguchi does not cure the deficiencies of Nakao, since Moriguchi does not teach or fairly suggest a step of dry forming or the unexpected advantages derived therefrom.

Moriguchi discloses a production method for graphite powder suitable for a negative electrode material of a lithium ion secondary battery. It discloses adding resin powders (i.e., polyethylene or polyvinyl alcohol powders) to graphite powder; dry mixing the components; molding the resulting mixture by hot-pressing using a metal mold; and then simultaneously thermally affixing the molded product onto the current collector.

However, Moriguchi does not disclose activated carbon as an active material, nor does Moriguchi disclose the use of a particulate elastomer as a binder. Additionally, it should be noted that Moriguchi discloses the production method of electrode for lithium ion secondary battery, not for an electric double layer capacitor, as is required by the present invention.

As such, significant patentable distinctions exist between the present invention and the teachings of the cited art.

Claim 13

Applicants respectfully submit that claim 13 is further distinguished from the teachings of the cited art. Present claim 13 recites that at the time of mixing a particulate elastomer and a carbonaceous material with each other in a powdery form, there is a concentration of solid contents of 50% or more by weight.

On this matter, the Examiner pointed out that 66% of solids (200 parts solid latex/300 total parts) is dispersed in water at a concentration of 30-70% in Nakao (column 18, line 30). However, Applicants respectfully submit that the Examiner's understanding of Nakao is incorrect.

In Nakao, there is a description that "the emulsion of such latex is often dispersed in emulsion state in water at concentration of 30 to 70 wt%, and therefore when using in electrode solution, it is preferred to dilute in purified water at specified concentration, and add activated carbon and conductive agent" (see column 18, lines 29-33).

Thus, from Nakao, the artisan would find that the concentration of solid contents of 30-70% is too high to apply on both sides of the conductive film, so that the emulsion dispersed in water at concentration of 30 to 70 wt% is preferably needed to be further diluted with purified water. As mentioned above, Nakao uses the wet forming method, so the mixture is needed to

have a low solids concentration.

Therefore, Nakao does not disclose the mixture having a high solids concentration as defined in claim 13 of present invention. Further, Nakao does not disclose or suggest that the mixture with a high solids concentration is used in a dry-forming method without dilution.

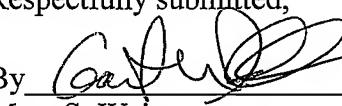
In view of the above amendment, applicant believes the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen, Ph.D., Esq., Reg. No. 43,575, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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Attachment:

- 1) New Sheet (Figure 1)
- 2) Experimental Report